Claims

What is claimed is:

1. A packet processing method for a node of a data transfer network, said method comprising:

associating a timer with a data packet received and stored by a central queue of the node, said timer measuring a length of time which said data packet is stored in said central queue and comprising one timer of a plurality of timers disposed in timer logic external to the central queue;

providing said length of time to said central queue when said central queue is ready to transmit said data packet; and

allowing transmission of said data packet if said length of time is less than a defined target, and preventing transmission of said data packet if said length of time is greater than said defined target.

2. The method of claim 1, further comprising repeating said associating for each of a plurality of received and stored data packets, wherein each of said plurality of timers has a state, the states of said plurality of timers residing in an array, and wherein said method further comprises periodically advancing the states of a group of said plurality of timers substantially simultaneously.

3. The method of claim 2, wherein the states of said group of timers comprise one of a row or a column in said array.

4. The method of claim 2, wherein said array is a multi-port array, and wherein said associating further comprises setting substantially simultaneously initial states for the associated timers of multiple data packets in said multi-port array via a plurality of array ports of the multi-port array.

5. The method of claim 2, wherein said array is a multi-port array, and wherein said providing further comprises obtaining substantially simultaneously the states for the associated timers of multiple data packets from said multi-port array via a plurality of array ports of the multi-port array.

6. The method of claim 2, wherein said array is a multi-port array, and said associating further comprises setting an initial state for said timer in said array via array ports of the multi-port array, and said providing further comprises obtaining the state of a timer associated with another data packet via the array ports of the multi-port array, and said periodically advancing further comprises obtaining the states of said group of said plurality of timers substantially simultaneously via the array ports, wherein when said setting, said providing, and said periodically advancing overlap in time, said setting and said providing have higher priority than said periodically advancing with respect to accessing the array ports of the multi-port array.

7. The method of claim 6, wherein said setting is responsive to a set-timer request made by said central queue, and said providing is responsive to a read-timer request made by said central queue.

8. The method of claim 7, wherein said periodically advancing further comprises advancing the states of a subgroup of timers of the group of timers when said set-timer request or said read-timer request concurrently accesses a timer in said group of timers, wherein the concurrently accessed timer is not advanced by said periodically advancing.

9. A packet processing system for a node of a data transfer network, said system comprising:

means for associating a timer with a data packet received and stored by a central queue of the node, said timer measuring a length of time which said data packet is stored in said central queue and comprising one timer of a plurality of timers disposed in timer logic external to the central queue;

means for providing said length of time to said central queue when said central queue is ready to transmit said data packet; and

means for allowing transmission of said data packet if said length of time is less than a defined target, and preventing transmission of said data packet if said length of time is greater than said defined target.

10. The system of claim 9, further comprising means for repeating said associating for each of a plurality of received and stored data packets, wherein each of said plurality of timers has a state, the states of said plurality of timers residing in an array, and wherein said system further comprises means for periodically advancing the states of a group of said plurality of timers substantially simultaneously.

11. The system of claim 10, wherein the states of said group of timers comprise one of a row or a column in said array.

12. The system of claim 10, wherein said array is a multi-port array, and wherein said means for associating further comprises means for setting substantially simultaneously initial states for the associated timers of multiple data packets in said multi-port array via a plurality of array ports of the multi-port array.

13. The system of claim 10, wherein said array is a multi-port array, and wherein said means for providing further comprises means for obtaining substantially simultaneously the states for the associated timers of multiple data packets from said multi-port array via a plurality of array ports of the multi-port array.

14. The system of claim 10, wherein said array is a multi-port array, and said means for associating further comprises means for setting an initial state for said timer in said array via array ports of the multi-port array, and said means for providing further comprises means for obtaining the state of a timer associated with another data packet via the array ports of the multi-port array, and said means for periodically advancing further comprises means for obtaining the states of said group of said plurality of timers substantially simultaneously via the array ports, wherein when said means for setting, said means for providing, and said means for periodically advancing overlap in time, said means for setting and said means for providing have higher priority than said means for periodically advancing with respect to accessing the array ports of the multi-port array.

15. The system of claim 14, wherein said means for setting is responsive to a set-timer request made by said central queue, and said means for providing is responsive to a read-timer request made by said central queue.

16. The system of claim 15, wherein said means for periodically advancing further comprises means for advancing the states of a subgroup of timers of the group of timers when said set-timer request or said read-timer request concurrently accesses a timer in said group of timers, wherein the concurrently accessed timer is not advanced by said means for periodically advancing.

17. At least one program storage device readable by a machine embodying at least one program of instructions executable by the machine to perform a packet processing method for a node of a data transfer network, said method comprising:

associating a timer with a data packet received and stored by a central queue of the node, said timer measuring a length of time which said data packet is stored in said central queue and comprising one timer of a plurality of timers disposed in timer logic external to the central queue;

providing said length of time to said central queue when said central queue is ready to transmit said data packet; and

allowing transmission of said data packet if said length of time is less than a defined target, and preventing transmission of said data packet if said length of time is greater than said defined target.

18. The at least one program storage device of claim 17, wherein said method further comprises repeating said associating for each of a plurality of received and stored data packets, wherein each of said plurality of timers has a state, the states of said plurality of timers residing in an array, and wherein said method further comprises periodically advancing the states of a group of said plurality of timers substantially simultaneously.

19. The at least one program storage device of claim 18, wherein the states of said group of timers comprise one of a row or a column in said array.

20. The at least one program storage device of claim 18, wherein said array is a multi-port array, and wherein said associating further comprises setting substantially simultaneously initial states for the associated timers of multiple data packets in said multi-port array via a plurality of array ports of the multi-port array.

21. The at least one program storage device of claim 18, wherein said array is a multi-port array, and wherein said providing further comprises obtaining substantially simultaneously the states for the associated timers of multiple data packets from said multi-port array via a plurality of array ports of the multi-port array.

22. The at least one program storage device of claim 18, wherein said array is a multi-port array, and said associating further comprises setting an initial state for said timer in said array via array ports of the multi-port array, and said providing further comprises obtaining the state of a timer associated with another data packet via the array ports of the multi-port array, and said periodically advancing further comprises obtaining the states of said group of said plurality of timers substantially simultaneously via the array ports, wherein when said setting, said providing, and said periodically advancing overlap in time, said setting and said providing have higher priority than said periodically advancing with respect to accessing the array ports of the multi-port array.

23. The at least one program storage device of claim 22, wherein said setting is responsive to a set-timer request made by said central queue, and said providing is responsive to a read-timer request made by said central queue.

24. The at least one program storage device of claim 23, wherein said periodically advancing further comprises advancing the states of a subgroup of timers of the group of timers when said set-timer request or said read-timer request concurrently accesses a timer in said group of timers, wherein the concurrently accessed timer is not advanced by said periodically advancing.

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